REMARKS -- General

Applicants have rewritten all claims to define the invention more distinctly to overcome potential technical rejections.

The Rejection of all Claims Under § 102

Claims 1-3 were rejected under § 102 as being anticipated by Ross, Levy, and Schmitt.

A Review of Each Reference Cited

Ross (patent 5,830,529) teaches a method of printing coatings on light-permeable panels so that the coatings can be in extremely close proximity to each other while maintaining excellent registration.

Levy (patent 5,673,028) shows a devise for permanently recording and displaying the operational failure of electronic component on the surface of the component.

Schmitt (patent 5,412,035) shows a pressure-sensitive adhesive that loses attraction to a receptor when exposed to heat.

The Title Is Amended

By the above amendment, Applicants have amended the title to emphasize the novelty of the invention.

The Cited References Are Added To The Specification

The prior art references cited in the Office Letter have been added to the specification under the section "Background - Prior Art". Also, the term "Automated Data Capture (ADC)" has been added and defined in this section.

Claims Are Rewritten

Claims 1 to 3 have been rewritten as new claims 4 to 6 to define the invention more particularly and distinctly so as to define the invention over the prior art and overcome any potential technical objections.

Claim 1, now rewritten as new claim 4, recites a data capture devise composed of a standard bar code on which at least one additional module is printed with thermochromic material. The primary differences between Claim 1 and Claim 4 is the preamble which more properly states the nature and classification of the invention.

Claim 2, now rewritten as new claim 5, recites a data capture devise entirely composed of a single, quondam thermochromic material. The primary differences between Claim 1 and Claim 4 is the preamble which more properly states the nature and classification of the invention.

Claim 3, now rewritten as new claim 6, recites a data capture devise composed of a bar code printed entirely with multiple thermochromic materials. The primary differences between Claim 1 and Claim 4 is the preamble which more properly states the nature and classification of the invention. A slight variation in the final whereby statement is added to further clarify between Claim 5 and Claim 6.

Claims 4 To 6 Define Over Levy, Ross, And Schmitt Under § 102

Claims 1 to 3 were rejected under § 102 as being anticipated by Levy, Ross, and Schmitt. The distinctions of the present invention are submitted to be of patentable merit under § 102 and § 103. Applicants will discuss the general novelty of the present invention over each reference.

LEVY CLAIMS AN INDICATOR COMPRISING A BAR CODE IMAGE IN COMBINATION WITH AN ELECTROCHEMICAL MATERIAL ONLY.

Levy recites an electronic component failure indicator, which may comprise thermosensitive material in some embodiments of the invention.

Levy discloses the use of thermochromic materials, but only in the context of a identifying failed components (Col. 5, Line 1) as part of an electronic component (Col. 1, Line 8) in the electronics industry (Col. 1, Line 26; Col. 20, Line 46). He does not identify the use of thermochromic as part of a bar code for automated data capture. More particularly, Levy uses a different mode of operation for thermochromics within his teaching. Instead of the direct application of heat, he emphasizes that a single pulse of power (Abstract; Col. 5, Line 15; Col. 22, Line 15) would activate the thermochromic materials. This indirect use of thermochromics with electricity requires the addition of a wire (Abstract; Col. 32, Line 43) to provide resistance and produce a byproduct of heat. The Applicant's claim does not require the use of the additional element of a wire.

Levy's has only one mention of a bar code, which is contained within a specific claim (Claim 22). In Claim 22, Levy claims an indicator constructed of electrochemical material which may be represented in the form of a bar code image. Levy specifies that the electrochemical material permanently changes in response to a pulse of electric power (Col. 15, Line 3; Col. 25, Line 28; Col. 22, Line 15), or by a single pulse of power (Col. 5, Line 15), not as the result of the application of thermal changes, as the Applicants claim. Levy simply interchanges the use of thermochromics with electrochromics (Col. 15, Line 5) by the addition of a new wire element. In his abstract, Levy reinforces his lack of interest in teaching the use of thermochromics to monitor changes in heat. Here he states that his indicator "monitors one or more parameters of the electronic component other than temperature" (Abstract). Applicants clearly recite a bar code image comprising a thermochromic material that would directly respond to the application of thermal change.

Levy also teaches that his invention provides a permanent mark (Col. 22, Line 16; Col. 25, Line 25) which provides numerous advantages to his invention. Applicant's new claim 4 and 6 claim non-permanent changes which provides important advantages to the invention including the ability to monitor a temperature range in which the bar code is exposed.

SCHMITT SUGGESTS THE USE OF THERMOCHROMIC MATERIALS IN THE CREATION OF AN ADHESIVE.

Schmitt recites a method of enhancing the functionality of current pressure-sensitive adhesives (PSA) by adding a crystalline polymeric additive. Schmitt goes on to describe examples of how such an adhesive would be applied to the benefit of current PSA applications. In this description, Schmitt states that the elements of thermochromic and bar code (Col. 1, Line 26; Col. 10, Line 1) are separated by a flexible backing so that each component is placed on opposite sides of the backing preventing the synergist combination claimed by the Applicant's invention. Schmitt further distinguishes his teachings from the Applicants by showing that the thermochromic material would be an element contained only within the adhesive (Col. 16, Line 59) and that this adhesive would only change and react to the receptor while remaining unchanged to the backing itself (Col. 1, Line 52). Therefore, the suggested addition of a thermochromic material to the adhesive would leave the bar code appropriately unaffected since it is never combined, or intended to combine, with a bar code structure. In fact, the application of the thermochromic-enhanced adhesive to the bar code would assuredly cause the inadvertent adhesion of the bar code surface to an unintentional receptor, thereby making the bar code unreadable and useless.

This is further clarified in Schmitt's drawings (Fig. 3, Fig. 4). In these drawing, Schmitt clearly demonstrates the necessity of placing each element in a stacked manner so that the adhesive remains uncombined with the surface of the backing. In Fig. 4, the adhesive in his invention is clearly separated from the backing by the addition of a conventional

backing (one that contains neither thermochromic materials nor crystalline polymeric additive). In Fig. 3, if the backing were assumed to contained a visible bar code (not shown), the PSA adhesive (which would contain the thermochromic material) would be clearly separated by the material to which the bar code must be printed. This again clearly demonstrates that Schmitt intended such components to function independent of, and un-reliant on, each other and thus remain uncombined. The backing, possibly printed with a bar code, would simply be affixed to the receptor using Schmitt's special PSA adhesive. If the adhesive was combine with crystalline and a thermochromic material, it could be removed from the receptor without leaving adhesive behind. Schmitt does not demonstrate the combination of thermochromic within the bar code by reference, example, or implied advantage.

Schmitt's device is similar to many other bar code prior arts such as "Electronic article surveillance label assembly and method of manufacture," United States Patent 5,687,102 by Souder, et al. In Souder's patent, a bar code is printed to one side of the label and a pressure sensitive adhesive on the opposing, or bottom, side of the label (Claim 1). Like Schmitt, Souder's pressure-sensitive adhesive does not interact with the bar code because each element is separated by opposite surface of backing. In both Schmitt and Souder, the purpose of compound containing thermochromic materials is to adhere to a surface, not to record and electronically report environmental changes of the surface, as the Applicant's claim. In both Schmitt and Souder, the purpose of the bar code is unimportant to the scope of their inventions, while it is of central importance to the Applicant's invention.

ROSS SUGGESTS THE USE OF A BAR CODE PRINTED TO A LIGHT-PERMEABLE PANEL

Ross teaches a method of printing coatings on light-permeable panels so that the coatings can be applied in extremely close proximity to each other while maintaining excellent registration. Ross refers to thermochromic materials on nine occasions within his patent. However, three of the occasions are simple descriptions of thermochromic inks (Col. 8,

Line 61; Col. 32, Line 57; Column 43, Line 10), and three are used as apparently random illustrations of possible coatings (Col. 5, Line 46; Col. 39, Line 23; Col. 80, Line 41). In three other incidents, he references thermochromics in illustrations that are well know within the art. For instance, he discusses the use of thermochromics applied in bands around a cooking utensil (Col. 49, Line 47) so that the thermochromic ink would change at a predetermined temperature level. In this example, Ross does not explain the use of bands as a chosen image, but he does point to the fact that the thermochromics will obviously change color at a predetermined temperature level. This fragment of the explanation provides no insights into the art until he discusses the use of perimeter coating alignment in the next sentence. He points to the use of his invention in creating the bands so that they are printed edge-to-edge as suggested by his invention. The advantage of his invention is the ability to print multiple colors and types of inks so that they are in extremely close proximity. This clearly eliminates the possibility that his bands were referencing the modules of a bar code. In the same example, he also suggested what he calls a actual "useful" idea: using thermochromics to print the word "HOT" in red color on the cooking utensil. This reinforces the idea that his original reference to printed bands was an example only and had no practical application by his interpretation. Therefore, this reference could serve as prior art for the use of thermochromics to print alpha warning messages. However, this also exists abundantly in the art. This reference clearly does not act as prior art to the Applicant's combination of a bar code printed with thermochromic ink since Ross defines the only "useful" application of thermochromic materials (Col. 49, Line 54) as the production of alpha characters.

Ross's final reference to thermochromic comes in Fig. 16 description (Col. 40, Line 27). Here he describes a multi-layered structure of coating attached to a see-through structure. The objective of the description is to create a surface that blocks or partially blocks the light permeability of the base structure. Ross suggests that the use of a perimeter coating alignment would allow for the build-up of coatings that would be useful in effecting the opaqueness of the surface. He suggests that it would be possible to create a multi-layered structure that was composed of one coating, which produced heat from the application of

an electrical current, and a second coating of thermochromic that would respond to the heat generated by the first coating. Here Ross demonstrates how the perimeter coating alignment would be effective in creating a precisely layered coating structure that would be able to combine the benefits of individual coatings. The result of Ross's example is the ability to adjust the opaqueness of the base element. Besides the reference of thermochromics in his example, the reference does not serve as prior art to the Applicants since it refers to the use of thermochromics layered on other coatings to adjust the opaqueness of a see-through structure. Applicants clearly claim a bar code printed with the use of thermochromics.

Ross also separately demonstrates a method of producing hidden identification indicia, including, in only one occasion, bar codes (Fig. 45B; Col. 16, Line 63). In said Fig. 45B, Ross shows a hidden bar code image purposefully concealed within a multi-layer structure. This structure is composed of an essential element to the Ross printing process: a light-permeable panel.

Applicant's invention eliminates the need or desire for such a structure. Applicants specifically claim a bar code structure comprising only two elements: a bar code and thermochromic materials incorporated in some fashion into said bar code structure. This additional element of a light-permeable structure is of paramount importance in Ross's ability to define over almost all prior art involving printing methods. Since Ross's term for coating encompasses all materials (Col. 1, Line 8; Col. 5, Line 41), and his term for indicia encompasses all images (Col. 6, Line 63), it is critical for him to define these elements in association with other elements. Without this light-permeable structure, all images comprised of any possible coating would be claimed. This claim would include a bar code printed with standard ink, a combination abundant within the art. Ross simply suggests that his patent could be applied to printing a bar code with any material.

Applicants specifically claim a data capture structure comprising only two elements: a bar code and thermochromic materials incorporated in some fashion into said bar code. Ross does not specifically suggest the combination of bar code and thermochromic

materials. Ross simply teaches that any image (Col. 6, Line 63), which he sites or illustrates many examples (Col. 6, Line 67, Fig. 44B – 47E) can be produced by any manner (Col. 1, Line 42); using any material (Col. 1, Line 8; Col. 5, Line 41), including those still un-invented (Col. 9, Line 54; Col. 32, Line 54). Applicants respectively submit that if this reference were to hold as prior art to Applicant's invention, it would subsequently hold as prior art to all patents resulting in a printed article, whether the new invention be a process or article of manufacturer. Therefore, Ross did not, and could not, predict all the infinite combinations and their subsequent unexpected new results. By not directly suggesting their combination, Ross did not predict the two element combination of the present invention: bar code and thermochromic materials.

Claims 4 To 6 Define Over Levy, Ross, And Schmitt Under § 103

In anticipation of possible section § 103 objections, the distinctions of the present invention are submitted to be of patentable merit under § 103 for the following reasons:

Unexpected Results

Applicants submit that the novel physical features of new claims 4 to 6 are also unobvious and hence patentable under § 103 since they produce substantial new and unexpected results over previous bar code art. The most significant unexpected result of the present invention is that two bar codes which were printed with identical codes at the point of production can scan with two different codes at the point of scan. This is the first time a bar code has been able to 'print' itself after the initial printing production. In essence, this invention allows the bar code to become a functioning element:

- This invention can monitor food safety and prevent the sale of potentially tainted product. In a similar manner, the new bar code can assist in the automated monitoring of the world blood supply and ensure that all blood is handled within safe temperature ranges.
- This invention can reduce the amount of packaging used by manufacturers of certain products. For instance, the present invention can eliminate expensive

packaging techniques, such as the 12 pack casing. The 12 pack casing was developed to cover the UPC code of the items within the case, such as a single can of Coca-Cola. However, a single can of Coca-Cola would only be sold cold and a 12 pack would only be sold warm. By using the present invention, the manufacturer could eliminate a large amount of wasted packaging by using a less expensive plastic webbing (called a Hi-Cone). The present invention would provide significant savings to some manufacturers and reduce the waste generated from product packaging.

- This invention can allow the UPC to electronically report a new data element that is essential to marketers: the place within a retail outlet from where a product was selected by the consumer. This will provide important information on the importance of displays, coolers, and secondary locations. This essential data will allow for better store planning, better promotional planning, and better post-sales analysis.

Lack Of Implementation

Many consumer product manufacturers have incorporated the use thermochromics into the packaging for the purpose of reporting the temperature of their products. For instance, Kromocorp's heat sensitive inks experienced instantaneous success in Europe, appearing on beer, wine and candy bars to indicate optimum drinking or eating temperatures (http://www2.bfls.com/ppc/0299ink.html). What is marked about this example is that the manufacturers created package labels that simultaneously included both respective technologies of the present invention (bar code and thermochromic) yet failed to combine them. Also important to note from this example was that the manufacturers were trying to accomplish the same results of the present invention: report temperature of product using the product's packaging. However, the reporting method of the current invention is entirely different than current art, since it is not intended to be read by humans.

If the above manufacturers had also added thermochromic materials to the bar code, it would have provided many advantages including greatly enhancing their objective, provided additional feed back on immediate consumption items, and enhanced their image with retailers. Similar examples of this use of thermochromics to report product temperature within consumer packaging can be seen in the U.S. (http://www.spearinc.com/redwolf.htm) and Australia (http://www.spearinc.com/prredant.htm). The fact that those skilled in these arts failed to combine the elements of thermochromic and bar code together to accomplish their objective asserts the unobviousness of the present invention.

Solution Of A Long-Felt And Unsolved Need

Marketing has long held the five P's of Marketing that are crucial to the accurate prediction and analysis of business objectives. Most of these "P" variables are monitored and projected at a high degree of accuracy. However, one "P," "Placement," has always eluded accurate capture. There is one significant obstacle marketers have not been able to overcome. For items with more than one location, retailers and manufacturers have been unable to determine exactly where a scanned item was selected within the retail outlet. This results in significant problems in analyzing sales data. For instance, if beer is set to a cooler, the number of product facings for each item are determined by the amount of product that was previously sold from the cooler. However, if a manufacturer had a promotional display or a secondary cooler location, the historical data would be useless. The planners would be forced to guess what percentage sold from each location. Manufacturers have tried many solutions to get around these issues, but none with permanent success. For instance, some manufacturers have tried to use promotional UPCs that would be located in only secondary displays. However, this produced the problem of what to do with extra merchandise that would be left over after a display period. Other manufacturers and retailers have tried manually placing new UPC codes over the pre-printed UPC code when the item was placed in a secondary location. However, this generated similar problems and dramatically increased labor costs.

Another long felt need of the consumer packaged goods and food safety industry is to monitor unsafe temperature changes that a product is exposed. For instance, the pantry life of milk is substantially reduced if it exposed to temperature greater than fifty degrees Fahrenheit. As another example, meat can generate dangerous bacteria if exposed to room temperature for only a short period of time. Various attempts have been made to find a solution. For instance, one manufacturer has recently received national attention (including the Wall Street Journal and national newscasts) for introducing a thermochromic dot that could be place on the package. If this dot turns a designated color, a checker could visually note the problem and replace the pack of product. However, this system has many glaring problems: it places food safety on the observations of a busy checker, relies on humans to uniformly see color, and ultimately does not prevent the sale of unsalable merchandise. Despite this idea's fan fare to a long unsolved need, it provided little operational success inside of retail outlets.

Failure of others to find a solution to these long-felt and unsolved needs asserts the unobviousness of the present invention.

New Principle of Operation

The present invention recites a new principle of operation. The present invention shows an automated data capture component that can be used to record change. In two significant ways, this is an entirely new principle to bar code art. First, prior bar code art all recite a bar code that produces a static data set. This static data set is permanently encoded at the point of bar code's production. Second, the bar code was used as either a database key or a miniature database. This differs from the purpose of present invention because the present invention is non-static and independent of the initial code created during the point of production. This is the first time a bar code is not only used simply to report information, but also to monitor and record information. This is also the first time a bar code has the ability to report more than one set of data. For instance, the invention as specified in Claim 6, could allow the user to automatically record that the sample was

maintained in a temperature range of 25°C and 35°C. These attributes gives the bar code the dual capacity of both a meter and the recorded output of the meter.

The provision of a new principle of operation for a bar code asserts the unobviousness of the present invention.

Applicants Request Reconsideration

Applicants submit that new claims 4 to 6 are allowable over the cited references and solicit reconsideration and allowance.

Conclusion

For all of the above reasons, Applicants submit that the claims all define patentably over the prior art under § 102 because they recite a structure that is novel and unobvious over the cited prior art. Specifically, the article of manufacture defined by the amended claims is a bar code in combination with thermochromic materials. The cited prior art does not recite or imply a bar code constructed in this manner. Therefore Applicants submit that this application is now in full condition for allowance, which action Applicants respectfully solicit.

Conditional Request for Constructive Assistance

Applicants have amended the specification and claims of this application so that they are proper, definite, and define a novel structure that is also unobvious. If, for any reason this application is not believed to be in full condition for allowance, Applicants respectfully request the constructive assistance and suggestions of the Examiner pursuant to M.P.E.P. § 707.07(j) in order that the undersigned can place this application in allowable condition as soon as possible and without the need for further proceedings.

Very respectfully,

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